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Re: ET Docket No. 13-49

Dear Ms. Dortch,

My name is Rick Harnish and I am the Executive Director of the Wireless Internet Service Providers Association (WISPA). I appreciate your attention to this letter and all of the other letters written by supporters of the WISPA, Cambium Networks, Mimosa and JAB Wireless Petitions for Reconsideration in ET Docket No. 13-49. The following letter expresses my extreme concern over a recent rule change I believe has been made in error.

I'm writing today as an individual supporting the WISPA Petition for Reconsideration to rule changes requiring more restrictive Out of Band Emissions (OOBE) in the 5.725 -5.85 GHz ISM band. I would like to show how the change in the rules that harmonizes the 5 GHz bands will have a disastrous effect on Rural Broadband and many industries that currently use the ISM band for Point-to-Point (PtP) and Point to Multi-Point (PtMP) broadband and data connections between locations. I will cover a number of far-reaching economic impacts, beyond those the Commissioners and OET staff may have understood completely when approving the rule change.

1. Background: I will explain my background and expertise in the WISP industry.
2. Physical Impact: I will explain how this rule change may cause a collapse of WISP networks which currently provide broadband to millions of customers in the United States, provide data connections between remote facilities of schools, county/city governments and industries.

3. Economic Impact: I will demonstrate the economic impact on thousands of fixed wireless Internet service providers (WISPs), rural communities, and manufacturers of ISM band equipment, commercial clients, schools and county governments.
4. Spectrum Impact: I will explain on how the rule change will impact large areas of the country where the TDWR radar stations are not located. I will also make suggestions on how to achieve protection to the TDWR stations without the draconian consequences resulting from the rule change. Additionally, I will explain some intricacies stemming from the 5 GHz rule change and what can be expected as a result of that change.
5. Equipment Impact: I will give my perspectives on how the rule change will affect equipment manufacturers, antenna manufacturers, PtMP base stations, PtP backhaul links and Customer Premise Equipment (CPE). This equipment is used by a wide range of public and private industries, including the WISP industry.
6. Global Impact: I will dive into the global impact the rule change may have on United States broadband deployments and the effect the more restrictive rule may have on manufacturers and future investment in the US market.
7. Wi-fi Offloading: I will explain some of the trends I see which may have impacted the harmonization decision in the rule change, as it relates to offloading in spite of its dire consequences to rural broadband.
8. Competition: Lastly, I summarize the effects this ruling will have on competition in the broadband industry and the economy.

Attached at the end of this letter [Addendum 1] are the 3128 American consumers and businesses that are supporting WISPA's Petition for Reconsideration of the ET Docket No. 13-49 rule changes. In addition to the signatories, I have attached comments from the supporters in a separate document [Addendum 2] to protect the commenters' identity. I have used various comments throughout this document.

"Internet service is a must for my daughter and I. I work in the evenings utilizing the internet and my daughter completes her homework assignments utilizing the internet. If this service is taken away from us or if the price increases, our productivity will be slowed way down. I am a single mother and cannot afford to spend any more than what I already do for my internet service. The internet is the window to our world. It is our library in our home. It is our means of being able to make ends meet." ***– Winchester, Indiana***

As a life-long resident of Rural America, I am passionate for the success of small businesses which are the backbone of our society. I sincerely hope my comments are taken to heart and reconsideration of the recent rule change will be accepted.

1. **Background:** I developed my perspectives from a long history in the WISP Industry, dating back to 1997, when our company installed our first unlicensed Access Point in the attic of our office building so we could offer T1 speeds to our local library across the street and other surrounding businesses. Our network grew to cover 19 counties in Indiana and Ohio and we assisted seven additional WISP businesses in getting started to serve their local rural communities with broadband. I coined the term vWISP (virtual WISP) in 2004, as our company assisted these seven WISPs either get started or become more efficient. Our company leveraged our industry experience, technical and physical assets and provided a menu of outsourced services we could handle for them. This program made the vWISPs entrance into the business and rapid growth much easier.

   The entire combined network served nearly 4000 fixed wireless broadband customers and used 160 interconnected tower locations, most of which were connected with 5.725 - 5.825 GHz ISM PtP links. Throughout much of the rural areas covered by our service and that of our vWISP partners, WISP broadband service was the only broadband option. Even today, there are few rural broadband choices in this area, 15 years later. Our business was completely unsubsidized and received no state or federal grants. We observed ILECs collecting subsidies from the government, upgrading the more metropolitan areas and then moving older DSlam equipment to rural areas. The quality of the rural phone lines often only supported minimal broadband service, if any at all.

In 2004, I joined six other WISP entrepreneurs from around the nation to found WISPA, the Wireless Internet Service Providers Association, a 501c6 trade association. Our mission was and still is to promote the development, advancement and unification of the WISP industry. Our goal was to offer similar businesses like ours a unified voice at the FCC, Congress and also in State level politics. This grassroots effort has grown to over 800 member companies today. WISPA strives to represent our industry of hard working, self-funded entrepreneurs and provide methods to protect their investments, businesses, employees and customers to the best of our ability. We educate our members softening their challenges, hold state, regional and national conferences, provide communication tools and most of all, work hand-in-hand with the FCC and Congress as new legislation and regulatory issues are proposed and debated. We have built a close-knit and strong knowledge-sharing community which has been instrumental in expanding successful rural, suburban and metropolitan broadband competition and service.

I was appointed Executive Director of WISPA in 2010. I'm not sure I could find a more rewarding job than supporting the WISP industry, which includes operators who continually and aggressively deploy fixed wireless broadband service to many unserved or underserved areas of the country. Our industry enables rural, suburban and metropolitan communities to take advantage of the many opportunities which broadband facilitates. Without broadband and voice services from the WISP industry, many consumers and businesses across the nation would have little or no access to affordable broadband. I don't hesitate in saying our nation's broadband ranking on the world scale would be dismal at best, if it were not for the fixed wireless broadband industry. This industry was enabled by the Commission in 1985, which ignited an era of innovation which now spans 30 years. Innovation that includes Wi-fi, baby monitors, garage door openers, Bluetooth, RFID and last but not least, broadband. All this from what had been deemed junk spectrum at the time. This visionary achievement created an open

spectrum opportunity which has driven spectacular innovation advances that have blessed billions of consumers worldwide with conveniences unheard of 30 years ago. Without a doubt, the unlicensed spectrum bands are the most efficiently used spectrum in history, making this the most successful spectrum experiment ever. Providing this spectrum to the public free of charge has generated tax revenues from the sale of devices and services accorded from the spectrum, far outweighing the revenue any one-time spectrum auction has earned. Unlicensed spectrum is the gift to the American people that keeps on giving. Not often are such Win/Win regulatory actions made that create opportunities, jobs, innovation, tax revenue and better lifestyles. We need to do more of this, don't you think?

2. **Physical Impact**: Data networks are built one piece at a time, with a master plan and goal. In the case of outdoor networks, there are many variables which can affect their design, deployment and performance. Prudent network engineers minimize as many variables as possible to insure maximum uptime and performance. Commonly thought of variables may include facilities, construction techniques, power design and availability, network design, staff, weather, acts of God, replacement logistics, equipment life span and legal contracts. There are also intangible variables such as RF interference, DOS attacks, customer habits and preferences, dynamic innovation advances, the economy and in this case, inconsistent government rules and regulations. It is this last intangible variable that's most concerning to myself, our industry, other industries and rural broadband consumers across the country.

   A rule that has been in place for many years and from which massive broadband networks have been built has recently been changed. A rule change that will severely impact the confidence of entrepreneurs and investors to create broadband opportunities which improve our nation's rural business climate and assets.

The rule change modifies Out of Band Emissions (OOBE) in the 5.725-5.85 GHz ISM band. I believe there will be immense economic repercussions to the WISP industry, school and government facilities, many other industries and "trickle-down" economic effects to consumers and all of the above as a result of the rule change. The rule change contradicts the nation's goal of ubiquitous broadband. It is for this very reason that I support WISPA's Petition for Reconsideration. I am concerned this rule change has widespread impacts which weren't thoroughly vetted in the process of making the change.

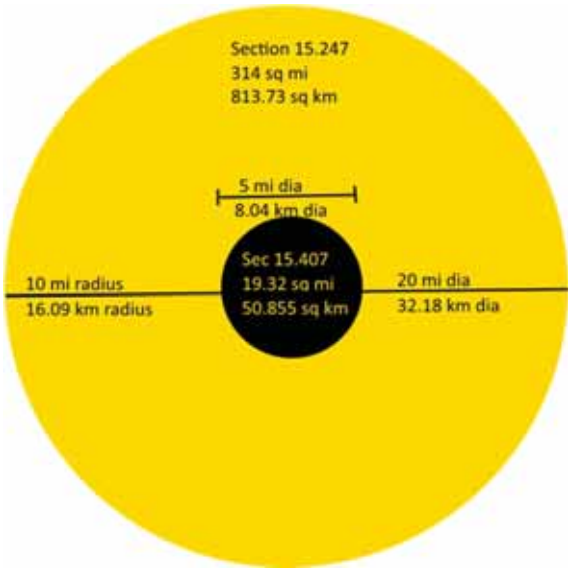
3. **Economic Impact:**

   a. **WISP Businesses:** If the Commission's decision to impose more restrictive OOBE limits stands, the economic impact to WISP operators will be devastating. These operators are mostly self-funded, have invested personal savings and have reinvested hard-earned profits to expand their networks. As a consequence of the rule change, when current grandfathered equipment becomes obsolete or damaged, the equipment will need to be replaced with equipment which complies with stricter Section 15.407 OOBE standards. At that time, network operators will be forced to make one of the following choices:

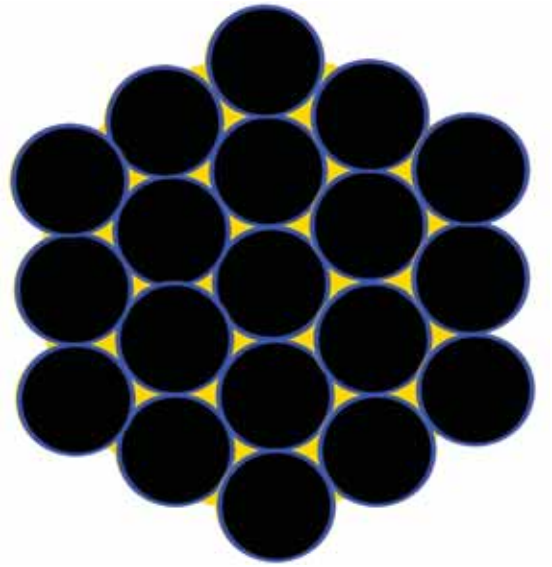
      1) Operate the new radios at lower power and use antennas at lower gain, or

      2) Purchase replacement radios if available which use additional filters to reduce OOBE emissions when operating at higher power.

I am first concerned that lower power limits will reduce network coverage of WISP networks by an estimated 75%, according to Cambium Networks Petition for Reconsideration. Below is a picture representation of the dramatic coverage area reduction moving from Section 15.247 OOBE rules to Section 15.407 OOBE rules in relation to WISP networks. Under Section 15.247 rules, link distance ranges of 10 miles were easily accomplished. Under Section 15.407 rules, the estimated range decreases to 2.5 miles. The impact is a coverage area loss of approximately a 94%.



The next picture representation below is shows how many 2.5 mile circular areas it will take to cover the same approximate area under Section 15.247 rules. With minimal overlap of the smaller circles, there are 19 smaller circles or we could say tower locations, compared to only 1 circle or tower location before the rule change. The collocation contracts alone would be cost-prohibitive and in most areas unachievable. This visualization does not even consider a 19x equipment cost increase to cover the same area. Where population demographics are sparse as in Rural America, the return on investment would be inadequate. Therefore, lower power limits are not a financially successful business model for any WISP.



Secondly, Cambium Networks stated that adding filters to each radio would increase the price dramatically, in some cases more than two times. Manufacturers have stated the entire 125 MHz of the ISM band would effectively be reduced to 45 MHz of usable spectrum after 40 MHz on each side of the band is removed by filtering. In this case, Cambium Networks states that channel size would also have to be reduced from 20 MHz to 5 MHz, which would decrease throughput to the end user by a 4x factor. Higher equipment costs and lower throughput is a marketing disaster for manufacturers. I doubt WISP equipment manufacturers will create a product that costs two times as much as it previously did and have 25% of the throughput it did previously. So, adding filters is an impractical solution and is not an option.

In order to plan for equipment obsolescence, a network operator would need to begin looking for 18 new facilities, produce 18 new "option" lease contracts with landlords for some unknown future date when the equipment reaches the end of its useful life. This would be multiplied by each and every tower location an operator has. In the case of equipment damage, caused by a lightning strike for example, the WISP operator would immediately lose 75% or greater of its customer base. Both of these scenarios are a logistically and financially impractical and would spell disaster to the WISP industry and rural broadband.

I recently conducted a survey the effects these changes would have on WISP businesses. Many WISP operators replied they would have to shut down their operations because they would not be able to afford to comply with the changes imposed by the rule change. Those that could comply estimated they would need to raise consumer monthly prices an average of $84.54/month to justify the investment. Typical WISP service in rural areas averages

$55/month. Therefore, a consumer could expect an increased monthly bill of nearly $130/month for lower quality service than they have today.

If you have traveled Rural America like I have, then you realize the rural economy in this country is severely depressed. Rural consumers are barely getting by today and most could not afford such an increase.

"I moved to rural Scott County in July of 2011. After suffering through painful and ineffective satellite service I was blessed to find Shelby Broadband. This company has provided excellent service and a reliable internet connection at a reasonable cost. There is no other company that can offer this service in this area of rural Scott County. If this service is compromised it will present a significant negative impact on the ability of rural residents to access high speed internet. In addition, this company has provided needed jobs to the area and supported the local economy. If this rule change is executed we will once again be shot down by the government just when great strides are being made in electronic communication for rural Americans." ***– Scott County, Kentucky***

WISPA estimates approximately 3,000,000 customers in the United States get service from a WISP provider, approximately one third of which are served by the 5 GHz spectrum. According to the survey, WISPs estimate the total cost per subscriber will average $1250/subscriber. This mandated cost does not make economic sense to most operators. If permitted to stand, this rule change will create a 1 billion dollar catastrophe for the WISP industry alone. This figure does not even include in the economic "trickle-down" effect rural communities will incur when broadband service is lost.

b. Communities: As I travel through small and medium sized towns in Rural America, I see many empty store fronts where once thriving businesses existed. There are many examples of these businesses such as pharmacies, diners, lumber yards, grocery stores, clothing stores, hardware stores, etc. Unfortunately, our country has become an economy where only the largest companies can survive. It might seem odd for me to admit, but broadband has harmed these small businesses as well. Today's consumers purchase online, instead of going downtown to shop. I realize, it is all part of the evolution of society. I accept that,

however, I have a steadfast conflict when the new rule imposed on the 5 GHz band, will take away another wave of small businesses in Rural America. The very businesses that enable rural consumers to enjoy the benefits of broadband will be shut down with one stroke of the regulatory pen. Consumers will lose the ability to work from home, take online college courses, do homework from home without needing to go to the local library, apply for online jobs, buy license plates online, watch movies online, call their loved ones, and the list goes on and on.

> *"This will force me to give up my online classes and stop my continuing education endeavors."* ***– Poplarville, Mississippi***

The impact on rural economies and consumer convenience will be substantial. The "trickle-down" effects in Rural America will be costly and public outcry will be immense.

WISPA also recently conducted a petition drive to support WISPA's Petition for Reconsideration on ET Docket No. 13-49. WISPs, their customers and many more American consumers, 3128 to be exact, signed the petition. Attached to this document is a list of all those that filled out the online petition. Separate from the list of supporters is a list of comments signatories made during the procedure. The comments are an excellent representation on how the loss of broadband will affect their lives, jobs, businesses, education and convenience, such as:

- *"This will just add additional expenses of which reduce the quality of life that I am able to provide for my family. It's bad enough that we have a horrible economy, add to this the EPA regulations that will make my electricity more expensive, health care reform that has already tripled my cost of insurance, and now the FCC wants to make my internet more expensive. Quit passing rules and regulations that make it more expensive to live, if this administration was truly concerned about the middle and lower class then they might take this into consideration."* ***– Garden City, Kansas***

- *"This degree of service reduction would eliminate my only current available high-speed internet connection. As a physician, this would have serious negative effect on my care for my patients."* ***– Lowell, Michigan***

- *"Without an adequate internet connection within our rural area I would not be capable of continuing to make a living in my current line of work. So, I would either be required to find a new occupation or relocated to continue my current line of work. Either choice would be unfair to any American."* ***– Pleasanton, Texas***

c. **Manufacturers:** This rule change will also affect manufacturers. Manufacturers will need to decide whether the investment to build equipment incorporating filtering has adequate economy of scale when the market is limited to the United States. As stated earlier, this equipment would have less spectral efficiency, less bandwidth capacity, less customer capacity and would cost an estimated $300 more per radio. I predict manufacturers will most likely not invest in such a product.

   The alternative is to reduce power. This may be the only affordable option manufacturers have. Reducing power output means the market (WISPs) will need to purchase more AP's and build more towers to reach their current customer base. While selling additional AP's may seem like a boon to manufacturers, the economic demographics in many parts of the country, the cost of land leases and tower construction, additional insurance and operation costs, will likely prevent WISPs from investing in new facilities and equipment.

   Assuming current equipment can be software-modified to be certified under lower power limitations of the new rule, firmware updates will need to be uploaded to previously legal equipment installed by previously legally operating WISPs. Once power is decreased, it's estimated that 75% of the existing clients will no longer have enough fade margin to successfully communicate with the tower base equipment and their service will cease.

d. **Commercial Clients:** Many rural, suburban and metropolitan WISPs provide service to commercial clients. In many cases, the WISPs provide the only broadband service the business can affordably get. This rule change may cause extreme hardship on these businesses as they suddenly lose their broadband connection, voice services and connection to cloud services they have become accustomed and reliant to using.

Recently, many industries have mandated multiple broadband connections to insure broadband connectivity is continuous. WISPs play an important role in providing both primary and/or redundant broadband connections allowing businesses to comply with industry mandates. This FCC rule change will eliminate a very important commercial service to businesses that employ millions of people. The "trickle down" effect continues.

"The 5GHz unlicensed spectrum is critical to providing the bandwidth needed for installing video and sensor data in rural communities and at remote operations sites. Industries affected include agriculture, water exploration, mining, oil and gas, aquaculture, and rural service businesses that need Internet. The FCC's actions will significantly affect the efficiency of these businesses." ***– Alexandria, Virginia***

There are many commercial industries and businesses with remote facilities. These industries often install 5 GHz ISM PtP links to create a Wide Area Network (WAN) to reach all of their facilities and increases operational efficiencies. As grandfathered equipment becomes obsolete and suitable replacements cannot be found, a large business for example may lose millions of dollars in lost operational costs, sales and other expenses. The business will also need to purchase and install legal replacement wireless equipment before previous business continuity can continue. I personally know of many industries like this, such as aggregate processors, food processors, grain elevators, fertilizer dealers, banks, farming operations and many others. The "trickle-down" effect continues and will cause hardship on American industry.

e. School Systems and County Governments: Many school systems and county governments have installed and rely on PTP backhauls between facilities which operate under the Section 15.247 OOBE rules in the 5 GHz ISM band.

"Our local government depends on the services of our local provider who would be severely impacted by this measure. We also rely on multi-mile wireless links to serve our remote sites, i.e., ambulance, fire and police substations and schools. This measure would handicap our current capabilities, force us to spend money we don't have on upgrades, and work to eliminate a local small business and simultaneously eliminate the competitive climate which led us to this carrier in the first place after a

large provider couldn't provide continuous and uninterrupted service nor a competitive price." – ***Bedford County, Tennessee***

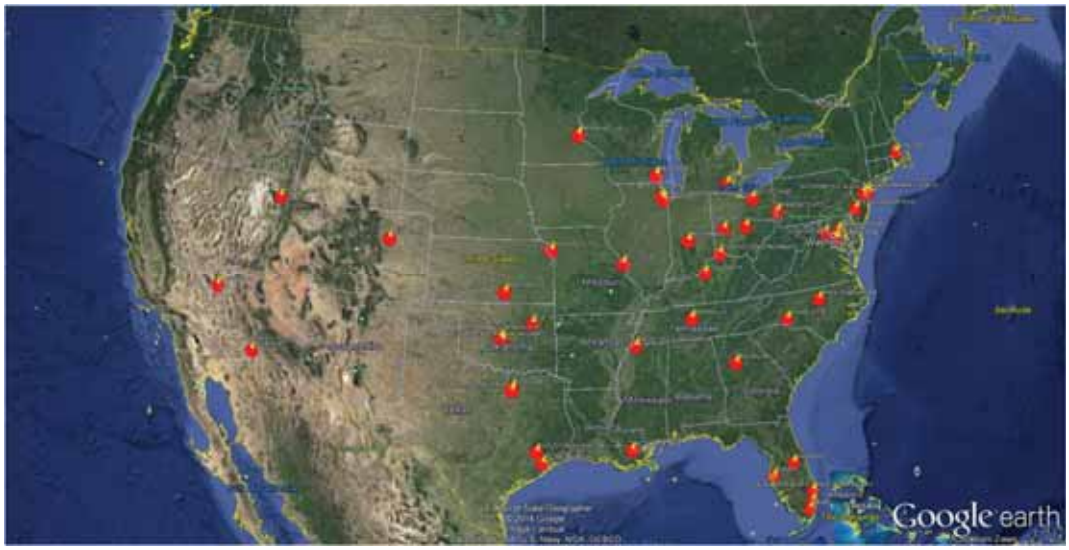
It is no secret, school systems and county governments are strapped for cash. They have adopted unlicensed PTP equipment out of necessity because of the relatively low installation costs and excellent performance they have achieved with this equipment. County Governments across the United States are very similar to school systems. Data communication between the courthouse, sheriff's office, highway garage and multiple other facilities is often handled with ISM PTP backhauls. The "trickle-down" effect continues to cause hardship on local government and education.

4. Spectrum Impact:

a. TDWR: The adoption of stricter OOBE limits for operations in the 5.725-5.85 ISM band appear to be motivated by an apparent desire to eliminate the potential of harmful interference to Terminal Doppler Weather Radar (TDWRs) stations. Documented enforcement actions have been taken where similar software-modified equipment was operating in the 5.6 – 5.65 GHz TDWR band. However, there are no reported instances of legally operating equipment certified under Section 15.247 in the 5.725 – 5.850 GHZ ISM band has in fact caused harmful interference to TDWR stations due to Out of Band Emissions (OOBE) transmissions. Rather, such interference has been caused by illegally modified equipment, a practice that will be eliminated for new equipment under enhanced security rules the Commission has adopted. I believe alternative methods proposed in the new rules should first be given the opportunity to eliminate TDWR interference, rather than applying more restrictive Section 15.407 OOBE rules to the 5.725 – 5.825 GHz ISM spectrum.

Continuing education of the entire unlicensed industry, which includes WISPs, school systems, county governments, and various industries is prudent and logical. Enforcement penalties have been adequate and I support the FCC taking measures against operators of all kinds when interference to TDWR stations occurred. WISPA will continue to ramp up educational efforts to the entire WISP industry. I also believe manufacturers of equipment in the ISM band have an obligation to educate their entire customer base about the serious issue of TDWR interference.

Preferably, geolocation (GPS) equipment can be voluntarily incorporated into system design, so devices within a 35 km (22 mi) range of any TDWR station will be denied the ability to operate in the 5.570-5.680 GHz range. This solution should comply with the FCC, NTIA and FAA's desire to eliminate interference to TDWRs. This solution would also allow efficient "spectrum sharing" of the TDWR band in areas outside the TDWR station exclusion zones. The map below of the lower 48 states shows 35 km (22 mi) radius circles around each of the 48 TDWR stations. This combined area is approximately 2% of the total land mass of the United States. It is not logical to penalize 98+% of the United States by applying Section 15.407 OOBE rules to the "workhorse" unlicensed 5.725 – 5.850 GHz ISM band. Most of the penalized area is primarily Rural America where WISPs supply valuable broadband service to millions of consumers and businesses.



TDWR radar is used to detect wind shear and other weather conditions that may affect safe airplane takeoffs and landings. I realize it is extremely important to safeguard our millions of air travelers. I should be, I am one of those regular air travelers. I feel strongly however, alternative methods of eliminating potential interference to TDWR stations have not been perused extensively. Given a full 75 MHz of protection margin between the TDWR stations and the ISM band, it is highly unlikely and not proven that OOBE transmissions can be attributed to previous or future TDWR interference cases. The new rule's effect on the 5.725 – 5.85 GHz ISM band is overreaching.

WISPA has worked hard to educate the WISP industry about TDWR stations since July 27, 2010, when WISPA, the FCC, the NTIA and the FAA worked in partnership and Mr. Julius Knapp, Chief of the OET, issued a memorandum on the "Elimination of interference to Terminal Doppler Weather Radar (TDWR). WISPA also helped establish a TDWR online database tool with Spectrum Bridge (http://www.spectrumbridge.com/udia/home.aspx). Users in the UNII band (5.47-5.725 GHz) were encouraged to check the database before installing any co-frequency PTP or PTMP systems. Checking the database allowed the user to see if their proposed or installed equipment was operating within a 35 km (22 mi) radius

exclusion zone around any of the 48 TDWR stations. We encouraged users of the UNII band to configure equipment at least 30 MHz away from the center frequency used by the TDWR station in their area. Even operators as far away as 100 km were encouraged not to point any directional antennas at an azimuth towards the TDWR station.

The Commission adopted new enhanced software security requirements in the recent Report and Order. These requirements will further enhance the ability of new devices to improve the detection of radar signals. Additionally, the Commission adopted rules for manufacturers to include better Dynamic Frequency Selection (DFS) in the UNII equipment. These rule enhancements and ramped up education efforts should be provided an opportunity to eliminate TDWR interference before applying more restrictive OOBE limits to the 5.725-5.85 GHz ISM band.

b. 5 GHz Spectrum: The recent R&O seeks to harmonize the other bands in 5 GHz under more restrictive 15.407 OOBE rules. We applaud the decision in the R&O to keep the unlimited gain antenna rules for the ISM band, however the decrease in power limits under harmonized 15.407 rules will cause a link distance reduction of an estimated 75% in the 5.725-5.85 GHz ISM band. As I have stated previously, this band has been used extensively by the WISP industry, school systems, county government and industry to achieve long distance data links for many years. With filtering options being financially unviable. Neither of the two alternatives is workable. The new rule contravenes Congressional and Commission objectives of promoting broadband to unserved and rural areas.

In conclusion, I believe the advanced software security, DFS and TPL enhancements outlined in the March R&O will prove effective in eliminating TDWR interference. I encourage removing rules which state 5.725-5.85 GHz ISM devices need to harmonize with the rest of

the band under 15.407 OOBE limit rules. This will enable WISPs, school systems, county governments and other industries, to continue using and deploying equipment certified under Section 15.247. This strategy would be a wiser first step, than the radical rule change made in the current R&O mandating stricter OOBE limits under the auspices of harmonization.

5. **Equipment Impact:**

   a. **Radio Manufacturers:** Much of this has been discussed previously. But to describe the impact further, radio manufacturers will need to re-engineer and certify current equipment lines or produce new equipment lines in accordance to Section 15.407 rules. These rules are different than most of the rest of the world. Manufacturers may be hesitant to make the investment, especially when it comes to adding filtering. These hardware changes will cause new items, item numbers, pricing, stocking changes, distributor education, stocking challenges, production and shipping challenges, procurement challenges and much more. Every change has an expense, but government mandated expenses causing severe public and economic consequences are the toughest to swallow.

      In the case of lower power limits, software (firmware) will need to be rewritten and made available to upload to current devices. The impact of the lower power limits has been described previously.

   b. **Antenna Manufacturers:** Antenna manufacturers that produce larger antennas for the industry will be damaged financially as well. Once the new rule goes into effect, the antenna manufacturers will have obsolete product lines. Obsolete product lines mean

less sales, which leads to layoffs of some employees and/or retooling of production facilities to make other products. The “trickle-down” effect continues.

c. **WISP PtMP Base Stations:** Base Stations (APs) will either need to be turned down in power to comply with 15.407 OOBE limits or replaced with new filtered equipment. The replacement of equipment in a WISP network normally happens for one of two reasons, lightning or other Acts of God have damaged the equipment or new technology has become available. Operators make a business decision to decide whether investment in new technology provides enough benefit to change. New technology normally improves latency and broadband speeds. In this case however, equipment changed by a regulatory mandate will degrade service levels available today. While the government is defining broadband at faster speeds on one hand, they are creating rules on the other hand that will decrease broadband speeds. I encourage the Commission to adopt alternative measures to eliminate TDWR interference problems, rather than contradict the goals of faster broadband speeds and more ubiquitous coverage.

   If the lower power limits are imposed, it has been estimated as many as 75% of WISP clients will lose adequate signal levels to maintain service. Again, while the government is trying to expand broadband to unserved and rural areas on one hand, on the other hand the rule change is actually causing service disruption or cessation to many consumers and businesses that currently have broadband service. This is very counterproductive to the nation’s goals and I believe the financial impact and consumer outcry will be considerable.

   Historically, WISPs are the first to deploy broadband in many parts of the country. They do so with their own hard work and finances to improve their communities’ broadband opportunities. Meanwhile, competitive broadband providers often depend on

government subsidies to justify the deployment costs to build in rural areas where population demographics don't justify their investment. This is yet another devastating "trickle-down" effect. American taxpayers will need to fund large corporations to build broadband systems to rural areas previously served by unsubsidized WISPs before the rule change. The lag time between loss of service and new subsidized broadband service may spell economic disaster for many rural businesses and consumers.

d. WISP PtP Links: As previously stated, the 5.725-5.85 GHz ISM band has been the "workhorse" for remote data links for many industries, including the WISP industry. These links can often span as much as 50-60 miles, given the unique unlimited gain antenna rules for the ISM band. While the unlimited gain antenna rule was preserved in the recent R&O, reduced power limits will reduce link distances by 75%. Wireless backhaul links connecting many remote facilities, towns and communities will no longer be practical or achievable. The only remedies are installation of expensive licensed spectrum equipment or installation of more relay towers. In many portions of the country, installing more towers is a hurdle not easily achieved. Local ordinances, land lease prices, tower construction costs, geography, government owned land are all hurdles to conquer and many are unconquerable. The end result will be communities and facilities suddenly "going dark" of broadband connectivity.

e. WISP CPE (Commercial and Consumer): Millions of CPE devices around the country will either need software (firmware) upgrades to comply with the lower power limit rule or will need to be replaced with filtered equipment certified under 15.407 OOBE rules. This means additional time, material, fuel and labor costs will be incurred by the operators. Consumers will not understand the changes, after all, it isn't their fault the

government changed the rules. This rule change creates an avoidable financial burden on operators and consumers.

CPE equipment located on lost customer locations will either be abandoned or retrieved at an expense and operators will need to deal with a previous satisfied customer who is now upset. This customer will not understand why one day they had broadband service and the next day they do not.

6. **Global Impact:** The impact of the rule changes will have far reaching effects. The US already lags behind many countries in broadband penetration and speed. The expansive sparsely populated land area of the United States has had an effect on this lag. Companies tend to invest in broadband infrastructure where the population demographics are the densest. Rural areas were left out by most of the larger Telco based companies unless government subsidies are available. As mentioned before, the adoption of unlicensed spectrum rules was a salvation for Rural America and the WISP industry became the savior.

   The WISP industry continues to push the envelope of new technology and find affordable ways to deploy broadband where returns on investment are much lower than metropolitan areas. The WISP industry is a "hard nut to crack" because the operators have found ways to be efficient from the very day they began business. They are residents of the communities they serve and know many of their customers personally. Their level of support and service is better than the norm because of the local pride they have in their communities.

   "Please do not limit or eliminate my internet service provider options! Please do not let over regulation limit or eliminate small businesses! BIG corporate take-over of our country must be curtailed. Not to mention my internet service which is excellent!! I can talk to a REAL PERSON on the phone LOCALLY whenever I want to." **– Pomeroy, Washington**

   Beyond that, many WISPs are virtually debt free because of efficient operations and grew organically as cash flow allowed.

The new rule will cause some global logistical problems for manufacturers as outlined earlier. Similar restrictive rules affected the 3.65 GHz band. While the world adopted 3.55 – 3.70 GHz as the WIMAX band about 10 years ago, the United States only approved equipment in the 3.65 – 3.7 GHz band. The result was manufacturers had to produce two sets of equipment. One set for the US and another more expansive set for the rest of the world. WISPA is pleased the Commission is now revisiting the 3.55 – 3.70 GHz bands and we are looking forward in participating in developing constructive final rules. We are now seeing the same thing happen in the 5 GHz band. This new rule isolates the US equipment market from the global equipment market. Smaller economies of scale will cause higher equipment prices. This rule change is an "anchor" which will hold down global investment in US broadband deployment, nothing more and nothing less. This rule change will be a challenge for manufacturers and will cause the US to continue to fall further behind the rest of the world in broadband deployment.

7. **Wifi Offloading:** It appears to me, the ultimate outcome of harmonization of the 5 GHz bands is to enable cell carriers and cable companies the ability to market high capacity Wifi offloading of mobile devices. As streaming video and other heavy bandwidth applications have become popular on mobile devices, tablets and laptops, cellular networks have often been unable to handle the load. While once ridiculing unlicensed frequencies, the cell carriers have suddenly found the unlicensed frequencies are saving their networks from collapse and other access point hosts are paying for the upload/download bandwidth instead of them. By offloading a major portion of the traffic, the mobile customers perceive better network operation and the cellular carriers enhance profits, after all the spectrum is "free". So much so, that they now have a voracious appetite for unlicensed spectrum and it appears, wish to dominate it.

   Cable Companies have also embraced unlicensed spectrum. For cable companies, Wifi is a way to extend their networks to reach more customers and build customer loyalty. More customers

mean more clout as they negotiate deals with Netflix, Amazon, YouTube, ESPN and many other content providers. I won't go into this in detail, because it is a Net Neutrality argument, but the concept remains. Accepting cellular offload traffic will also enhance cable companies' profits. Expect the noise level in the unlicensed bands to also increase dramatically, especially in metropolitan areas.

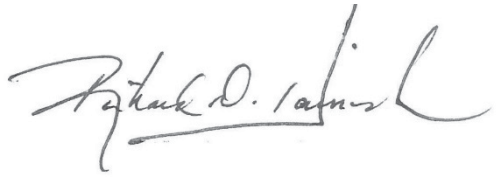
Without a doubt, the Wifi device industry along with the cellular and cable industries have impacted the Commission's decision to harmonize the 5 GHz band. I question whether the benefits this total harmonization should include the 5.725-5.85 GHz ISM band. Should we really sacrifice Rural America's broadband connectivity? I personally encourage the Commission to reconsider the rule change as per WISPA's Petition for Reconsideration.

8. **Competition:** The following bullet points summarize what the immediate future has in store.
    - **a.** Competition will decrease due to this rule change.
    - **b.** Broadband availability will decrease in many rural areas of the country.
    - **c.** Broadband build-out will slow or cease in rural areas.
    - **d.** Broadband pricing will increase due to less competition (Supply and Demand).
    - **e.** Broadband performance will decrease due to less competition (Fewer incentives to improve).
    - **f.** Broadband service levels will decrease due to less competition (Fewer incentives to improve).
    - **g.** Rural economies will suffer due to less broadband availability.
    - **h.** Rural populations and business will erode at an alarming rate.
    - **i.** American taxpayers will ultimately have to fund rural broadband replacement in the form of government subsidies.

I would like to thank the Commission for providing a mechanism for public comment while proposed rules are debated and after they are enacted. I appreciate the opportunity to provide my feedback and encourage the Commission to strongly consider the WISPA, Cambium Networks, Mimosa and Jab Wireless's Petitions for Reconsideration.

At this time I encourage the Commission to review the signatories, [Addendum 1] many consumers and businesses across the United States, supporting WISPA's Petition for Reconsideration. Their additional remarks [Addendum 2] were spurned when they discovered the impacts the rule change will have on their current broadband connection.

Respectfully submitted,



Richard Harnish
Executive Director – WISPA

Attachments:
[Addendum 1] Signatories supporting WISPA's Petition for Reconsideration
[Addendum 2] Comments by signatories of WISPA's Petition for Reconsideration